UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1878

Applicant(s) : KARL, W.

Serial No. :

Filed :

For : METHOD FOR PRODUCING A SHAFT, AND APPARATUS CONTAINING SUCH A SHAFT

SIMULTANEOUS AMENDMENT

May 21, 2002

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:

This Amendment is submitted simultaneously with filing of the above identified application.

With the present Amendment applicant has amended the claims so as to eliminate their multiple dependency.

Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Claims

1. Method for producing a shaft (22), in particular an armature shaft (22) of an electric motor-driven drive (10) that is brought to a nominal dimension (44), characterized in that the shaft (22) is reshaped at at least one point by means of material displacement (46) until the nominal dimension (44) is reached.

2. Method according to Claim 1, characterized in that the material displacement (46) takes place near one end (29) of the shaft (22).

3. Method according to [one of the Claims 1 through 2] Claim 1, characterized in that the material displacement (46) is carried out by burnishing the shaft (22).

4. Method according to [one of the Claims 1 through 3] Claim 1, characterized in that the length of the shaft (22) is measured during material displacement (46), and the material displacement (46) is terminated when the specified nominal dimension (44) is reached.

5. Method according to [one of the Claims 1 through 4] Claim 1, characterized in that the shaft (22) is installed in a pole well (13) of an electric motor (12), and then the material displacement (46) is carried out.

6. Method according to Claim 5, characterized in that the length of the part of the shaft (22) extending over the pole well (13) is measured and compared with the nominal dimension (44).

7. Method according to [one of the Claims 1 through 3 or 5] Claim 1, characterized in that an end play of the shaft (22) is measured during material displacement (46), and the material displacement (46) is terminated when an end play set value is reached.

8. Method according to [one of the preceding claims] Claim 1, characterized in that an endless screw (26) is rolled on the shaft (22) on one section, and the material displacement (46) up to the nominal dimension (44) takes place simultaneously or afterward at least section-by-section on the same machine tool.

9. Apparatus for adjusting components belonging to a motor vehicle comprising a drive motor (12) having an armature shaft (22) and a gear (14) arranged after this, in particular worm gear (24) that is actively connected to the drive motor (12) via the armature shaft (22), characterized in that the armature shaft (22) is brought to a specified nominal dimension (44) by means of material displacement (46) at at least one point, in particular by way of a method according to [one of the preceding claims] Claim 1.

10. Apparatus according to Claim 9, characterized in that the material displacement (46) of the shaft (22) lies on its end (29).

11. Apparatus according to [one of the Claims 9 or 10] Claim 9, characterized in that the cross-sectional area (50) of the material displacement (46) is semicircular.

12. Apparatus according to [one of the Claims 9 or 10] Claim 9, characterized in that the cross-sectional area (50) of the material displacement (46) is trapezoidal or rectangular.

13. Apparatus according to [one of the Claims 9 through 12] Claim 9, characterized in that the material displacement (46) reduces the diameter (52) of the shaft (22) by up to one-half.

14. Apparatus according to [one of the Claims 9 through 13] Claim 9, characterized in that the material displacement (46) has the shape of a circular ring.

Claims

1. Method for producing a shaft (22), in particular an armature shaft (22) of an electric motor-driven drive (10) that is brought to a nominal dimension (44), characterized in that the shaft (22) is reshaped at at least one point by means of material displacement (46) until the nominal dimension (44) is reached.

2. Method according to Claim 1, characterized in that the material displacement (46) takes place near one end (29) of the shaft (22).

3. Method according to Claim 1, characterized in that the material displacement (46) is carried out by burnishing the shaft (22).

4. Method according to Claim 1, characterized in that the length of the shaft (22) is measured during material displacement (46), and the material displacement (46) is terminated when the specified nominal dimension (44) is reached.

5. Method according to Claim 1, characterized in that the shaft (22) is installed in a pole well (13) of an electric motor (12), and then the material displacement (46) is carried out.

6. Method according to Claim 5, characterized in that the length of the part of the shaft (22) extending over the pole well (13) is measured and compared with the nominal dimension (44).

7. Method according to Claim 1, characterized in that an end play of the shaft (22) is measured during material displacement (46), and the material displacement (46) is terminated when an end play set value is reached.

8. Method according to Claim 1, characterized in that an endless screw (26) is rolled on the shaft (22) on one section, and the material displacement (46) up to the nominal dimension (44) takes place simultaneously or afterward at least section-by-section on the same machine tool.

9. Apparatus for adjusting components belonging to a motor vehicle comprising a drive motor (12) having an armature shaft (22) and a gear (14) arranged after this, in particular worm gear (24) that is actively connected to the drive motor (12) via the armature shaft (22), characterized in that the armature shaft (22) is brought to a specified nominal dimension (44) by means of material displacement (46) at at least one point, in particular by way of a method according to Claim 1.

10. Apparatus according to Claim 9, characterized in that the material displacement (46) of the shaft (22) lies on its end (29).

11. Apparatus according to Claim 9, characterized in that the cross-sectional area (50) of the material displacement (46) is semicircular.

12. Apparatus according to Claim 9, characterized in that the cross-sectional area (50) of the material displacement (46) is trapezoidal or rectangular.

13. Apparatus according to Claim 9, characterized in that the material displacement (46) reduces the diameter (52) of the shaft (22) by up to one-half.

14. Apparatus according to Claim 9, characterized in that the material displacement (46) has the shape of a circular ring.